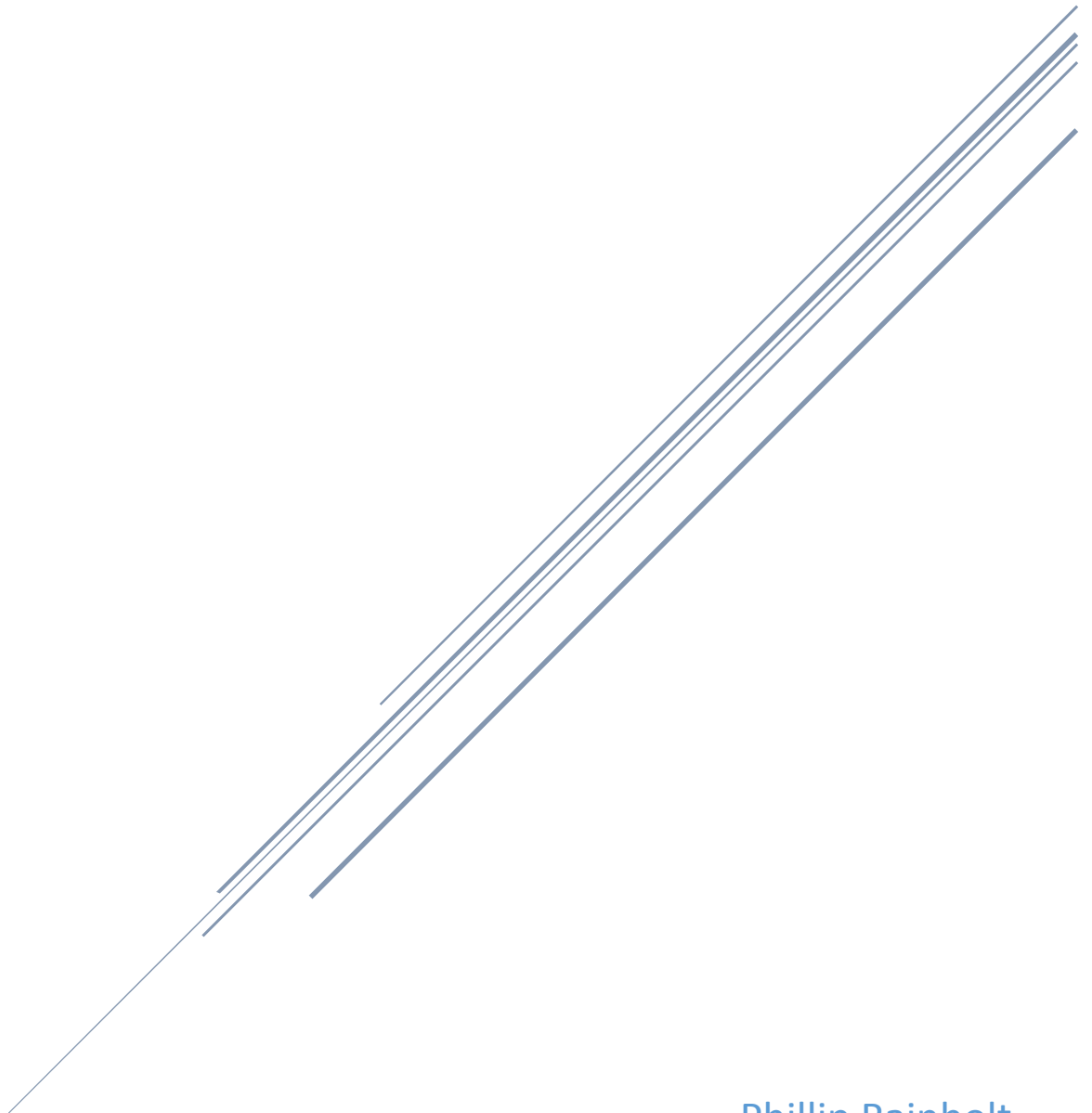


INTERN ABSTRACT

Holodeck – ISS Experience



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For the duration of my internship here at JSC for the summer 2016 session, the main project that I worked on dealt with hybrid reality simulations of the ISS. As an ER6 intern for the spacecraft software division, the main project that I worked alongside others was with regards to the Holodeck Virtual Reality Project, specifically with the ISS experience, with the use of the HTC Vive and controllers.

For the project itself, the main duties I was assigned dealt with making the overall ISS experience as realistic as possible, trying to incorporate more user interaction between the station and user. In doing so, my task was to incorporate moveable hatch doors on the station, as the current version of the ISS experience has a set of hatches that are always open and there is no way for users to interact with them and close them. Besides that, I was also assigned to attempt and make a model of a Robonaut that is on the space station possessable, in the sense that the user could go up and be able to take control of the Robonaut. While controlling the Robonaut, the user's point of view would become that of the Robonaut, allowing them to see from the Robonaut's perspective. On top of seeing from the Robonaut's view, the user would also be able to control and move the Robonaut's arms, moving them as their own, with the aid of the HTC Vive controllers. The user's controllers would become the Robonaut's arms and thus the user could move its arms around as such.

Regarding the accomplishments that I made for the project, I was able to go into Blender, which is an animation modeling software that we used to design objects to use on the ISS, and remove the hatches that were already there. By doing so, it allowed me to go back into Unreal Engine 4, the game development software that is being used for the entire project, and import a model of the space station with hatches. Thus, this gave me the opportunity to go and import the hatch that I removed back into unreal engine 4 to use as an animation object, and thus use it for

making both intractable manual and automatic hatches for the user. From there, I was able to go in and make automated hatches as well as manual hatches that the user could interact with. Due to technical difficulties and unexpected problems, I wasn't able to work on the Robonaut task as much as I had planned and was only able to get the hatch capability implemented.

The experience that I gained from my internship here is simply amazing, and the things that I learned from it are even more so, in the sense that I never would've seen myself learning and working with the programs and software that I did while here at JSC. I learned the basics of using the game development rendering engine Unreal 4, how Blueprints within Unreal Engine 4 work, and how visual scripting works (which is basically a visual form of coding). On top of that, I learned how to use Blender for creating 3D animated objects, and was able to import objects to be used inside Unreal Engine 4. Additionally, I got a glimpse of how to code and create my own plugins that could be used inside the Unreal Engine 4 to perform the functions that the task required.

My internship at JSC has allowed me to see what goes on inside of NASA and what kind of projects are being worked. It has allowed me to see another perspective on the type of career that I may want to pursue after I have graduated from the University of Houston. Working with virtual reality, the HTC Vive and Unreal Engine 4 has given me a peek as to what goes into developing games. However, it has also let me see what kind of things can be done using the same concepts game developers use in other areas. In the end, I see myself coming to the decision of whether or not I want to pursue a career into video game design and development, or continue my time here at NASA and be able to come back as a full-time employee in the future.